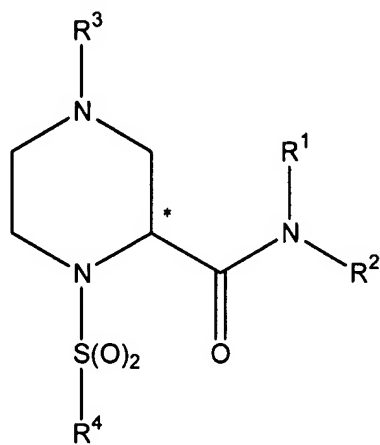


IN THE CLAIMS

1. (Original) A method for treating infertility in a mammal, comprising administering to a mammal suspected of infertility a therapeutically effective amount of a compound of Formula I:



wherein R¹ and R² are independently selected from the group comprising or consisting of hydrogen, C₁-C₁₂-alkyl, C₂-C₁₂-alkenyl, C₂-C₁₂-alkynyl, wherein said alkyl, alkenyl, alkynyl chains may be interrupted by a heteroatom selected from N, O or S, aryl, heteroaryl, saturated or unsaturated 3-8-membered cycloalkyl, heterocycloalkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl groups may be fused with 1-2 further cycloalkyl, heterocycloalkyl, aryl or heteroaryl group, an acyl moiety, C₁-C₁₂-alkyl aryl, C₁-C₁₂-alkyl heteroaryl, C₂-C₁₂-alkenyl aryl, C₂-C₁₂-alkenyl heteroaryl, C₂-C₁₂-alkynyl aryl, C₂-C₁₂-alkynyl heteroaryl, C₁-C₁₂-alkyl cycloalkyl, C₁-C₁₂-alkyl heterocycloalkyl, C₂-C₁₂-alkenyl cycloalkyl, C₂-C₁₂-alkenyl heterocycloalkyl, C₂-C₁₂-alkynyl cycloalkyl, C₂-C₁₂-alkynyl heterocycloalkyl, alkoxycarbonyl, aminocarbonyl, C₁-C₁₂-alkyl carboxy, C₁-C₁₂-alkyl acyl, aryl acyl, heteroaryl acyl, C₃-C₈-(hetero)cycloalkyl acyl, C₁-C₁₂-alkyl acyloxy, C₁-C₁₂-alkyl alkoxy, C₁-C₁₂-alkyl alkoxycarbonyl, C₁-C₁₂-alkyl aminocarbonyl, C₁-C₁₂-alkyl acylamino, acylamino, C₁-C₁₂-alkyl ureido, C₁-C₁₂-alkyl carbamate, C₁-C₁₂-alkyl amino, C₁-C₁₂-alkyl ammonium, C₁-C₁₂-alkyl sulfonyloxy, C₁-C₁₂-alkyl sulfonyl, C₁-C₁₂-alkyl sulfinyl, C₁-C₁₂-alkyl sulfanyl, C₁-C₁₂-alkyl sulfonylamino, or C₁-C₁₂-alkyl aminosulfonyl;

R³ is C₁-C₁₆-alkyl, C₂-C₁₆-alkenyl, C₂-C₁₆-alkynyl, wherein said alkyl, alkenyl, alkynyl chains may be interrupted by a heteroatom selected from N, O or S, aryl, heteroaryl, saturated or

unsaturated 3-8-membered cycloalkyl, heterocycloalkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl groups may be fused with 1-2 further cycloalkyl, heterocycloalkyl, aryl or heteroaryl group, an acyl moiety, C₁-C₁₆-alkyl aryl, C₁-C₁₆-alkyl heteroaryl, C₂-C₁₆-alkenyl aryl, C₂-C₁₆-alkenyl heteroaryl, C₂-C₁₆-alkynyl aryl, C₂-C₁₆-alkynyl heteroaryl, C₁-C₁₆-alkyl cycloalkyl, C₁-C₁₆-alkyl heterocycloalkyl, C₂-C₁₆-alkenyl cycloalkyl, C₂-C₁₆-alkenyl heterocycloalkyl, C₂-C₁₆-alkynyl cycloalkyl, C₂-C₁₆-alkynyl heterocycloalkyl, alkoxycarbonyl, aminocarbonyl, C₁-C₁₆-alkyl carboxy, C₁-C₁₆-alkyl acyl, aryl acyl, heteroaryl acyl, C₃-C₈-(hetero)cycloalkyl acyl, C₁-C₁₆-alkyl acyloxy, C₁-C₁₆-alkyl alkoxy, C₁-C₁₆-alkyl alkoxycarbonyl, C₁-C₁₆-alkyl aminocarbonyl, C₁-C₁₆-alkyl acylamino, acylamino, C₁-C₁₆-alkyl ureido, C₁-C₁₆-alkyl carbamate, C₁-C₁₆-alkyl amino, C₁-C₁₆-alkyl ammonium, C₁-C₁₆-alkyl sulfonyloxy, C₁-C₁₆-alkyl sulfonyl, C₁-C₁₆-alkyl sulfinyl, C₁-C₁₆-alkyl sulfanyl, C₁-C₁₆-alkyl sulfonylamino, or C₁-C₁₆-alkyl aminosulfonyl;

R⁴ is C₁-C₁₂-alkyl, C₂-C₁₂-alkenyl, C₂-C₁₂-alkynyl, wherein said alkyl, alkenyl, alkynyl chains may be interrupted by a heteroatom selected from N, O or S, aryl, heteroaryl, saturated or unsaturated 3-8-membered cycloalkyl, heterocycloalkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl groups may be fused with 1-2 further cycloalkyl, heterocycloalkyl, aryl or heteroaryl group; and pharmaceutically acceptable salts thereof.

2. (Currently Amended) ~~The~~ [[A]] method ~~of according to~~ claim 1, wherein ~~the compound of Formula I is such as~~ R¹ is H.

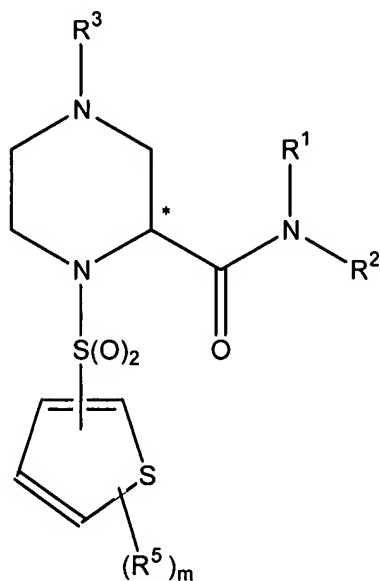
3. (Currently Amended) ~~The~~ [[A]] method ~~of claim 1 according to claims 1 or 2,~~ wherein ~~the compound of Formula I is such as~~ R² is selected from aryl, heteroaryl, 3-8 membered cycloalkyl and heterocycloalkyl.

4. (Currently Amended) ~~The~~ [[A]] method ~~of claim 1 according to any of the preceding claims,~~ wherein ~~the compound of Formula I is such as~~ R⁴ is selected from C₁-C₆-alkyl, amino, aryl, heteroaryl, 3-8-membered cycloalkyl and heterocycloalkyl.

5. (Currently Amended) ~~The~~ [[A]] method of treatment ~~of claim 1 according to any of the preceding claims,~~ wherein ~~the compound of Formula I is such as~~ R¹ is H; R² is aryl; R³

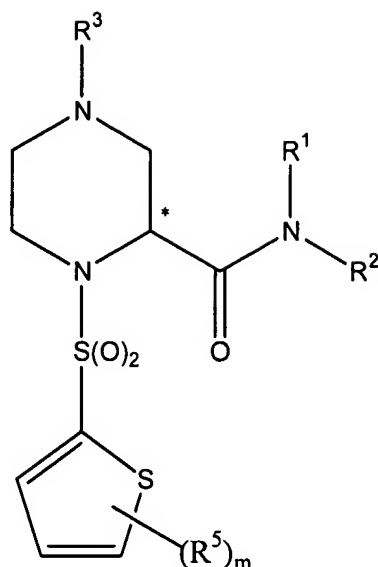
is selected from C₁-C₈-alkyl, C₁-C₈-acyl amino and C₁-C₈-alkyl acyl and R⁴ is selected from C₁-C₆-alkyl, amino, aryl and heteroaryl.

6. (Currently Amended) **The** [[A]] method of claim 1 wherein the compound has the following Formula II:



wherein ~~R¹, R² and R³ are the same as defined above in Formula I;~~
~~each~~ R⁵ is independently halogen, hydroxy or the same as defined for R¹;
 m is an integer of from 0 to 4; and pharmaceutically acceptable salts thereof.

7. (Currently Amended) **The** [[A]] method of claim 1 wherein the compound has the following Formula III:



III

wherein ~~R¹, R² and R³ are each the same as defined above in Formula I;~~ each R⁵ is independently halogen, hydroxy or the same as defined for R¹; m is an integer of from 0 to 4; and pharmaceutically acceptable salts thereof.

8. (Currently Amended) ~~The~~ [[A]] method of claim 7 ~~according to any of the preceding claims~~ wherein R¹ is hydrogen and R² is other than hydrogen.

9. (Currently Amended) ~~The~~ [[A]] method of claim 7 ~~according to any of the preceding claims~~ wherein R² is aryl or heteroaryl.

10. (Currently Amended) ~~The~~ [[A]] method of claim 7 ~~according to any of the preceding claims~~ wherein R³ is an n-alkyl group alkyl having five or more carbon atoms.

11. (Currently Amended) ~~The~~ [[A]] method of claim 10 wherein R³ is an-n-alkyl group alkyl having five or more carbon atoms.

12. (Currently Amended) ~~The~~ [[A]] method of claim 1 wherein R⁴ is optionally substituted alkyl, aryl, or heteroaryl.

13. (Currently Amended) ~~The~~ [[A]] method of claim 1 ~~any one of claims 1 through 12~~ wherein R² comprises a carbazolyl, tetrahydro-beta-carbolinyl or benzimidazolyl moiety.

14. (Currently Amended) **The** **[[A]]** method **of claim 1** ~~according to any of the preceding claims~~ wherein the compound of formula I is selected from the following group:

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridinyl-3-yl-1H-benzimidazol-5-yl)-amide);

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)amide]-1-pentylamide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 1-ethylamide 3-[(9-ethyl-9H-carbazol-3-yl)amide];

{[3-(9-ethyl-9H-carbazol-3-yl)carbamoyl]-4-(thiophene-2-sulfonyl)-piperazine-1-carbonyl]-amino}acetic acid ethyl ester;

4-pentanoyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl) amide;

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl) amide;

4-dimethylsulfamoyl-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)amide] 1-pentylamide;

4-(1-methyl-1H-imidazole-4-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-pentylamide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 1-pentylamide 3-[(3-pyridin-4-yl-phenyl)-amide];

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-{[2-(1H-imidazol-4-yl)-ethyl]-amide};

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-oxo-2,3,4,9-tetrahydro-1H-beta-carboline-6-yl)-amide;

4-heptyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzimidazol-5-yl)-amide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-[(3-imidazol-1-yl-propyl)-amide];

4-pentyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-oxo-2,3,4,9-tetrahydro-1H-beta-carboline-6-yl)amide;

4-heptyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-oxo-2,3,4,9-tetrahydro-1H-beta-carbolin-6-yl)amide;

4-(3-methylsulfanyl-propyl)-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl)-amide;

4-(4-ethyl-furan-3-ylmethyl)-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl)-amide;

3-(9-ethyl-9H-carbazol-3-ylcarbamoyl)-4-(thiophene-2-sulfonyl)-piperazin-1-yl] acetic acid ethyl ester;

1-benzenesulfonyl-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-pentyl-1-thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-hexyl-1-thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

1-(4-fluoro-benzenesulfonyl)-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

1-(2-fluoro-benzenesulfonyl)-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-octyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

4-heptyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

1-dimethylsulfamoyl-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

1-(butane-1-sulfonyl)-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

4-(3-methylsulfanyl-propyl)-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-[(2-methoxy-ethyl)-amide];

4-octyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzimidazol-5-yl) amide; and pharmaceutically acceptable salts thereof.

15. (Currently Amended) A method for treatment of a subject suffering from or susceptible to a disease or disorder associated with phosphodiesterase PDE4, adenosine transporters, or prostanoid receptors, comprising administering to the mammal a therapeutically effective amount of a compound of claim 1 ~~any one of claims 1 to 14~~.

16. (Currently Amended) The ~~[[A]]~~ method of ~~any one of claims 1 through claim~~ 15 wherein the mammal is a human.

17. (Currently Amended) The ~~[[A]]~~ method of ~~any one of claims 1 through claim~~ 16 wherein the mammal is a female.

18. (Currently Amended) The ~~[[A]]~~ method of claim 17 wherein the mammal is suffering from an ovulatory disorder.

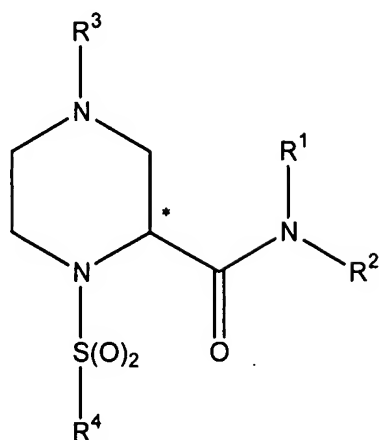
19. (Currently Amended) The ~~[[A]]~~ method of claim 17 wherein the mammal is being treated with an assisted reproduction procedure.

20. (Currently Amended) The ~~[[A]]~~ method of claim 17 wherein the mammal is undergoing in-vitro fertilization.

21. (Currently Amended) The ~~[[A]]~~ method of ~~any one of claims 1 through claim~~ 16 wherein the mammal is a male.

22. (Currently Amended) The ~~[[A]]~~ method of ~~any one of claims~~ claim 17 wherein the mammal is a male suffering from a spermatogenesis disorder.

23. (Original) A compound according to Formula I:



wherein R¹ is H;

R² is selected from aryl, heteriaryl, 3-8-membered cycloalkyl and heterocycloalkyl;

R³ is selected from C₁-C₁₆-alkyl, C₂-C₁₆-alkenyl, C₂-C₁₆-alkynyl, monocyclic aryl, monocyclic heteroaryl, 3-8-membered monocyclic cycloalkyl, monocyclic heterocycloalkyl, acyl, C₁-C₁₆-alkyl aryl, C₁-C₁₆-alkyl heteroaryl, C₂-C₁₆-alkenyl aryl, C₂-C₁₆-alkenyl heteroaryl, C₂-C₁₆-alkynyl aryl, C₂-C₁₆-alkynyl heteroaryl, C₁-C₁₆-alkyl cycloalkyl, C₁-C₁₆-alkyl heterocycloalkyl, C₂-C₁₆-alkenyl cycloalkyl, C₂-C₁₆-alkenyl heterocycloalkyl, C₂-C₁₆-alkynyl cycloalkyl, C₂-C₁₆-alkynyl heterocycloalkyl, alkoxycarbonyl, aminocarbonyl, C₁-C₁₆-alkyl carboxy, C₁-C₁₆-alkyl acyl, aryl acyl, heteroaryl acyl, C₃-C₈-(hetero)cycloalkyl acyl, C₁-C₁₆-alkyl acyloxy, C₁-C₁₆-alkyl alkoxy, C₁-C₁₆-alkyl alkoxycarbonyl, C₁-C₁₆-alkyl aminocarbonyl, C₁-C₁₆-alkyl acylamino, acylamino, C₁-C₁₆-alkyl sulfinyl, C₁-C₁₆-alkyl sulfanyl, C₁-C₁₆-alkyl ureido, C₁-C₁₆-alkyl carbamate, C₁-C₁₆-alkyl amino, C₁-C₁₆-alkyl ammonium;

R⁴ is selected from C₁-C₁₂-alkyl, C₂-C₁₂-alkenyl, C₂-C₁₂-alkynyl, aryl, heteroaryl, 3-8-membered cycloalkyl, heterocycloalkyl, and amino acid; and pharmaceutically acceptable salts thereof.

24. (Currently Amended) **The** **[[A]]** compound ~~of according to~~ claim 23 wherein R² is selected from aryl, heteroaryl, 3-8 membered cycloalkyl and heterocycloalkyl.

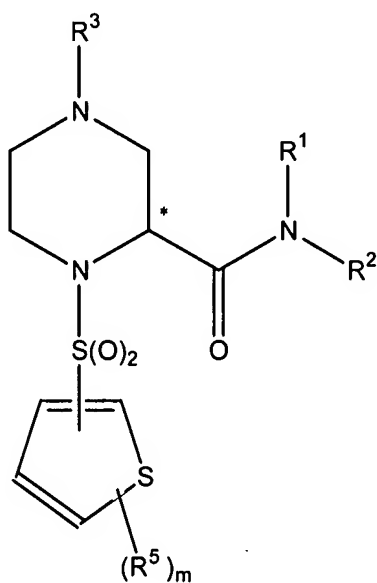
25. (Currently Amended) **The** **[[A]]** compound ~~of claim 23 according to claims 23 or 24~~, wherein R⁴ is selected from C₁-C₆-alkyl, C₁-C₆-alkyl amino, aryl, heteroaryl, 3-8-membered cycloalkyl and heterocycloalkyl.

26. (Currently Amended) **The [[A]] compound of claim 23 according to any one of claims 23 through 25**, wherein R^2 is aryl; R^3 is selected from C_1 - C_8 -alkyl, C_1 - C_8 -acyl amino and C_1 - C_8 -alkyl acyl and R^4 is selected from C_1 - C_6 -alkyl, amino aryl and heteroaryl.

27. (Currently Amended) **The [[A]] compound of claim 23 according to any one of claims 23 through 26**, wherein R^2 is fused phenyl.

28. (Currently Amended) **The [[A]] compound of claim 23 according to any one of claims 23 through 26**, wherein R^4 is thienyl.

29. (Currently Amended) **The [[A]] compound of claim 23 according to any one of claims 23 through 26** having the following Formula II:



II

wherein R^1 and R^2 are independently selected from the group comprising or consisting of hydrogen, C_1 - C_{12} -alkyl, C_2 - C_{12} -alkenyl, C_2 - C_{12} -alkynyl, wherein said alkyl, alkenyl, alkynyl chains may be interrupted by a heteroatom selected from N, O or S, aryl, heteroaryl, saturated or unsaturated 3-8-membered cycloalkyl, heterocycloalkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl groups may be fused with 1-2 further cycloalkyl, heterocycloalkyl, aryl or heteroaryl group, an acyl moiety, C_1 - C_{12} -alkyl aryl, C_1 - C_{12} -alkyl heteroaryl, C_2 - C_{12} -alkenyl aryl, C_2 - C_{12} -alkenyl heteroaryl, C_2 - C_{12} -alkynyl aryl, C_2 - C_{12} -alkynyl

heteroaryl, C₁-C₁₂-alkyl cycloalkyl, C₁-C₁₂-alkyl heterocycloalkyl, C₂-C₁₂-alkenyl cycloalkyl, C₂-C₁₂-alkenyl heterocycloalkyl, C₂-C₁₂-alkynyl cycloalkyl, C₂-C₁₂-alkynyl heterocycloalkyl, alkoxycarbonyl, aminocarbonyl, C₁-C₁₂-alkyl carboxy, C₁-C₁₂-alkyl acyl, aryl acyl, heteroaryl acyl, C₃-C₈-(hetero)cycloalkyl acyl, C₁-C₁₂-alkyl acyloxy, C₁-C₁₂-alkyl alkoxy, C₁-C₁₂-alkyl alkoxycarbonyl, C₁-C₁₂-alkyl aminocarbonyl, C₁-C₁₂-alkyl acylamino, acylamino, C₁-C₁₂-alkyl ureido, C₁-C₁₂-alkyl carbamate, C₁-C₁₂-alkyl amino, C₁-C₁₂-alkyl ammonium, C₁-C₁₂-alkyl sulfonyloxy, C₁-C₁₂-alkyl sulfonyl, C₁-C₁₂-alkyl sulfinyl, C₁-C₁₂-alkyl sulfanyl, C₁-C₁₂-alkyl sulfonylamino, or C₁-C₁₂-alkyl aminosulfonyl;

R³ is C₁-C₁₆-alkyl, C₂-C₁₆-alkenyl, C₂-C₁₆-alkynyl, wherein said alkyl, alkenyl, alkynyl chains may be interrupted by a heteroatom selected from N, O or S, aryl, heteroaryl, saturated or unsaturated 3-8-membered cycloalkyl, heterocycloalkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl groups may be fused with 1-2 further cycloalkyl, heterocycloalkyl, aryl or heteroaryl group, an acyl moiety, C₁-C₁₆-alkyl aryl, C₁-C₁₆-alkyl heteroaryl, C₂-C₁₆-alkenyl aryl, C₂-C₁₆-alkenyl heteroaryl, C₂-C₁₆-alkynyl aryl, C₂-C₁₆-alkynyl heteroaryl, C₁-C₁₆-alkyl cycloalkyl, C₁-C₁₆-alkyl heterocycloalkyl, C₂-C₁₆-alkenyl cycloalkyl, C₂-C₁₆-alkenyl heterocycloalkyl, C₂-C₁₆-alkynyl cycloalkyl, C₂-C₁₆-alkynyl heterocycloalkyl, alkoxycarbonyl, aminocarbonyl, C₁-C₁₆-alkyl carboxy, C₁-C₁₆-alkyl acyl, aryl acyl, heteroaryl acyl, C₃-C₈-(hetero)cycloalkyl acyl, C₁-C₁₆-alkyl acyloxy, C₁-C₁₆-alkyl alkoxy, C₁-C₁₆-alkyl alkoxycarbonyl, C₁-C₁₆-alkyl aminocarbonyl, C₁-C₁₆-alkyl acylamino, acylamino, C₁-C₁₆-alkyl ureido, C₁-C₁₆-alkyl carbamate, C₁-C₁₆-alkyl amino, C₁-C₁₆-alkyl ammonium, C₁-C₁₆-alkyl sulfonyloxy, C₁-C₁₆-alkyl sulfonyl, C₁-C₁₆-alkyl sulfinyl, C₁-C₁₆-alkyl sulfanyl, C₁-C₁₆-alkyl sulfonylamino, or C₁-C₁₆-alkyl aminosulfonyl;

R⁴ is C₁-C₁₂-alkyl, C₂-C₁₂-alkenyl, C₂-C₁₂-alkynyl, wherein said alkyl, alkenyl, alkynyl chains may be interrupted by a heteroatom selected from N, O or S, aryl, heteroaryl, saturated or unsaturated 3-8-membered cycloalkyl, heterocycloalkyl, wherein said cycloalkyl, heterocycloalkyl, aryl or heteroaryl groups may be fused with 1-2 further cycloalkyl, heterocycloalkyl, aryl or heteroaryl group;

R⁵ is independently halogen, hydroxy or the same as defined for R¹; m is an integer of from 0 to 4; and pharmaceutically acceptable salts thereof.

30. (Currently Amended) **The** **[[A]]** compound of **claim 23** ~~any of claims 23 to 29~~ wherein R² comprises a carbazolyl, tetrahydro-beta-carbolinyl or a benzimidazolyl moiety.

31. (Currently Amended) **The** **[[A]]** compound ~~according to any of the claims of~~ **claim 23** ~~to 30~~ that is selected from the following group:

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridinyl-3-yl-1H-benzimidazol-5-yl)-amide);

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)amide]-1-pentylamide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 1-ethylamide 3-[(9-ethyl-9H-carbazol-3-yl)amide];

{[3-(9-ethyl-9H-carbazol-3-yl)carbamoyl]-4-(thiophene-2-sulfonyl)-piperazine-1-carbonyl]-amino}acetic acid ethyl ester;

4-pentanoyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl) amide;

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl) amide;

4-dimethylsulfamoyl-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)amide] 1-pentylamide;

4-(1-methyl-1H-imidazole-4-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-pentylamide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 1-pentylamide 3-[(3-pyridin-4-yl-phenyl)-amide];

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-{[2-(1H-imidazol-4-yl)-ethyl]-amide};

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-oxo-2,3,4,9-tetrahydro-1H-beta-carbolin-6-yl)-amide;

4-heptyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzimidazol-5-yl)-amide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-[(3-imidazol-1-yl-propyl)-amide];

4-pentyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-oxo-2,3,4,9-tetrahydro-1H-beta-carbolin-6-yl)amide;

4-heptyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-oxo-2,3,4,9-tetrahydro-1H-beta-carbolin-6-yl)amide;

4-(3-methylsulfonyl-propyl)-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl)-amide;

4-(4-ethyl-furan-3-ylmethyl)-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (9-ethyl-9H-carbazol-3-yl)-amide;

3-(9-ethyl-9H-carbazol-3-ylcarbamoyl)-4-(thiophene-2-sulfonyl)-piperazin-1-yl] acetic acid ethyl ester;

1-benzenesulfonyl-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-pentyl-1-thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-hexyl-1-thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

1-(4-fluoro-benzenesulfonyl)-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

1-(2-fluoro-benzenesulfonyl)-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-octyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

4-heptyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

1-dimethylsulfamoyl-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

1-(butane-1-sulfonyl)-4-hexyl-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide;

4-hexyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

4-(3-methylsulfanyl-propyl)-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid (1-ethyl-2-pyridin-4-yl-1H-benzoimidazol-5-yl) amide;

4-(thiophene-2-sulfonyl)-piperazine-1,3-dicarboxylic acid 3-[(9-ethyl-9H-carbazol-3-yl)-amide] 1-[(2-methoxy-ethyl)-amide];

4-octyl-1-(thiophene-2-sulfonyl)-piperazine-2-carboxylic acid
(1-ethyl-2-pyridin-3-yl-1H-benzoimidazol-5-yl) amide.

32. (Currently Amended) **A pharmaceutical composition comprising the compound of claim 31.** ~~A compound according to any one of claims 23 through 31 for use as a medicament.~~

33. (Cancel)

34. (Currently Amended) A pharmaceutical composition comprising a pharmaceutically acceptable carrier and one or more compounds of **claim 31** ~~any one of claims 1 through 31.~~

35. (Original) A pharmaceutical composition of claim 34 wherein the compound is packaged together with instructions for use of the compound to treat infertility.